

## SYNOPSIS OF MEXICAN AND CENTRAL AMERICAN SPECIES OF *STACHYS* (LAMIACEAE)

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### ABSTRACT

A synoptical study of the Mexican and Central American species of *Stachys* is rendered. Thirty-eight species are recognized, as follows: *S. agraria*, widespread and weedy; *S. ajugoides*, Baja California and U.S.A.; *S. albotomentosa*, with two varieties, var. *albotomentosa* (from Hidalgo) and var. *potosina* B.L. Turner (from San Luis Potosí); *S. aristata*, endemic to Jalisco; *S. arriagana* B.L. Turner, *sp. nov.*, endemic to San Luis Potosí; *S. bigelovii*, northcentral México and closely adjacent U.S.A.; *S. boraginoides*, southcentral México; *S. calcicola*, Guatemala highlands; *S. coccinea*, widespread and common; *S. collina*, southernmost Puebla; *S. drummondii*, border regions of northeastern México and U.S.A.; *S. eriantha*, mostly eastcentral México; *S. globosa*, southcentral México; *S. grahamii*, widespread and common; *S. herrerana*, endemic to Hidalgo; *S. hintoniorum* B.L. Turner, *sp. nov.*, southeastern Coahuila and closely adjacent Nuevo León; *S. inclusa*, southern Puebla and closely adjacent Oaxaca; *S. jaimehintonii*, endemic to eastern Michoacán; *S. keerlii*, southcentral México; *S. langmaniae*, southern Nuevo León and closely adjacent Tamaulipas; *S. lindenbergii*, southcentral México and Guatemala; *S. mohinora* B.L. Turner, *sp. nov.*, southern Chihuahua; *S. moorei* B.L. Turner, *sp. nov.*, endemic to Hidalgo; *S. nepetifolia*, eastcentral México; *S. nubilorum*, Guatemala; *S. pacifica*, westernmost México; *S. penanevada* B.L. Turner, *sp. nov.*, endemic to southernmost Nuevo León and closely adjacent Tamaulipas; *S. pilosissima*, widespread from southern México to Costa Rica; *S. pittieri*, Costa Rica; *S. pringlei*, Hidalgo and Querétaro; *S. radicans*, southern México; *S. rotundifolia*, southern México; *S. sanchezii*, southcentral México; *S. sandersii* B.L. Turner, *sp. nov.*, endemic to western San Luis Potosí; *S. tenerrima*, Cape region of Baja California; *S. torresii*, endemic to Oaxaca; *S. venulosa*, endemic to western Durango; *S. vulnerabilis*, endemic to Cerro Potosí, Nuevo León. A key to the 38 species is provided, along



with complete synonymy. Distributional maps are constructed for all taxa, except for those populations occurring in Costa Rica (namely *S. pilosissima* and *S. pittieri*).

KEY WORDS: Lamiaceae, *Stachys*, México, Guatemala, Costa Rica

*Stachys* (s.l.) is a large, widely distributed, difficult genus occurring throughout the temperate and subtropical regions of the world. Epling (1934) provided a revisional treatment of the North American elements in which 28 species were recognized as occurring in México and Central America. Nelson (1981) treated the species of the southeastern U.S.A. (although definitive, some of his varietal taxa appear to lack morphogeographical coherence), while Mulligan & Munro (1989) provided an excellent taxonomic account of the North American species north of México, the latter buttressed by considerable field study, including chromosomal work. Mulligan & Munro concluded that 32 species of *Stachys* occurred in North America, north of México: 25 native species, the remainder introduced. In the present synopsis, which began as an attempt to identify various Mexican taxa related to *S. agraria*, I recognize 38 species, all believed to be native, as occurring in México and Central America, bringing to about 60 the number of species that appear to be native to North America. In that I have described a number of new species, both in a previous (Turner 1993) and the present paper from relatively limited herbarium material, it is highly likely that additional new species will come to the fore, since it is clear that many of the taxa are localized montane endemics (e.g., *S. albotomentosa*, *S. aristata*, *S. arriagana*, *S. calcicola*, *S. collina*, *S. herrerana*, *S. hintoniorum*, etc.).

ARTIFICIAL KEY TO MEXICAN AND CENTRAL AMERICAN  
*STACHYS*

- 1. Corolla tubes 12-25 mm long, orangish-red to red. .... (2)
- 1. Corolla tubes 2-12(-13) mm long, white, pink, pale blue to lavender. .(7)
  - 2. Leaves densely white-velvety beneath; San Luis Potosí, Hidalgo. ..  
..... 3. *S. albotomentosa*
  - 2. Leaves variously pubescent beneath, but not velvety. .... (3)
- 3. Angles of stem beset with stiff, retrorse, broad-based prickles. ....  
..... 21. *S. lindenii*
- 3. Angles of stem variously pubescent but prickles absent. .... (4)



4. Bracts of inflorescence thin, broad, and leafy, 15-25 mm wide and about as long as wide; Michoacán. ....18. *S. jaimehintonii*
4. Bracts of inflorescence not as described in the above. ....(5)
5. Midstem leaves large and thin, mostly 8-15 cm long, their petioles mostly (3-)4-10 cm long; calyx tube 3-5(-6) mm long; mostly Pacific-side of México. ....26. *S. pacifica*
5. Midstem leaves smaller and thicker, mostly 6-10(-12) cm long, their petioles 2-3(-4) cm long; calyx tube 6-10 mm long. ....(6)
  6. Calyx lobes 6-7 mm long; longer than the tube; Oaxaca. ....35. *S. torresii*
  6. Calyx lobes 2-5 mm long, shorter than the tube; widespread. ....9. *S. coccinea*
- 7(1). Stamens included within the tube, only slightly extending beyond the orifice, if at all. ....(8)
7. Stamens exserted beyond the orifice of the tube for 0.5-6.0 mm. ....(11)
  8. Corolla tubes 7-8 mm long. ....24. *S. nepetifolia*
  8. Corolla tubes (2-)3-6 mm long. ....(9)
9. Corolla tubes 2-4 mm long; Nuevo León. ....16. *S. hintoniorum*
9. Corolla tubes 4-6 mm long; southern México. ....(10)
  10. Midstem vestiture 0.3 mm high or less; Puebla, Oaxaca. ....17. *S. inclusa*
  10. Midstem vestiture 0.5-1.0 mm high; Michoacán, Oaxaca. ....19. *S. keerlii*
11. Corolla tubes 2-4 mm long. ....1. *S. agraria*
11. Corolla tubes (4-)5-12 mm long. ....(12)
  12. Upper lips 2.0-2.9 mm long. ....(13)
  12. Upper lips 3.0-6.5 mm long. ....(22)
13. Plants of Costa Rica. ....29. *S. pittieri*
13. Plants of Nicaragua and northwards. ....(14)
  14. Corollas w/o a well-defined annulus within the lower portion of the tubes. ....(15)



14. Corollas with a well-defined annulus within the lower portion of the tubes. ....(17)
15. Corolla tubes 4-7 mm long. ....(16)
15. Corolla tubes 10-12 mm long; Chihuahua. ....6. *S. bigelovii*
16. Leaves 3-4 times as long as wide; lower lips 5-7 mm long; Nuevo León and Tamaulipas. ....27. *S. penanevada*
16. Leaves 1.0-2.5 times as long as wide; lower lips 3-4 mm long; widespread. ....12. *S. eriantha*
17. Nutlets pubescent; San Luis Potosí, Hidalgo. ....(18)
17. Nutlets glabrous. ....(19)
18. Calyx 6-7 mm long; corolla tubes 5-9 mm long; Hidalgo. ....  
.....23. *S. moorei*
18. Calyx 9-10 mm long; corolla tubes 10-11 mm long; San Luis Potosí.  
.....5. *S. arriagana*
19. Flowers 4-8 to a node, the nodal clusters at maturity (after corolla loss) 10-15 mm across, not patently globose. ....(21)
19. Flowers 10-20 to a node, the nodal clusters at maturity 20-25 mm across, patently globose in fruit. ....(20)
20. Flowers mostly 10-12 to a node; vestiture sparse, ca. 0.5 mm high; calyx lobes contorting with age. ....13. *S. globosa*
20. Flowers (12-)14-20 to a node; vestiture conspicuous, 1.0-1.5 mm high; calyx not much contorting with age. ....34. *S. sandersii*
21. Midstems (and leaves) glabrous or nearly so; Jalisco. ....4. *S. aristata*
21. Midstems conspicuously pubescent; widespread. ....14. *S. grahamii*
- 22(12). Stems elongate, reclining or scrambling, beset with broad-based spreading hairs or prickles, or else the hairs densely retrorse and confined to angles of the stem. ....(23)
22. Stems not as described in the above, the hairs not broad-based or prickly. ....(24)
23. Hairs broad-based; corolla tubes mostly 11-13 mm long; Guatemala. ..  
.....25. *S. nubilorum*



- 23. Hairs not broad-based; corolla tubes mostly 9-10 mm long; México. ...  
   .....7. *S. boraginoides*
- 24. Plants of Baja California. .... (25)
- 24. Plants not of Baja California. .... (27)
- 25. Corolla tubes 9-14 mm long. .... 35. *S. tenerrima*
- 25. Corolla tubes 6-9 mm long. .... (26)
- 26. Plants annual. .... 35. *S. tenerrima*
- 26. Plants perennial. .... 2. *S. ajugoides*
- 27(24). Calyces 3-4 mm long; southern Puebla. .... 10. *S. collina*
- 27. Calyces 4-9 mm long. .... (28)
- 28. Flowers 10-20 per node, arranged in globose clusters. .... (29)
- 28. Flowers 1-8 per node, not in globose clusters. .... (30)
- 29. Flowers mostly 10-12 to a node; vestiture sparse, ca. 0.5 mm high; calyx lobes contorting with age. .... 13. *S. globosa*
- 29. Flowers (12-)14-20 to a node; vestiture conspicuous, 1.0-1.5 mm high; calyx not much contorting with age. .... 33. *S. sandersii*
- 30. Plants of Guatemala and southwards. .... (31)
- 30. Plants of México. .... (33)
- 31. Leaves mostly 3-5 cm long. .... 28. *S. pilosissima*
- 31. Leaves mostly 1-3 cm long; upper lips 5-6 mm long. .... (32)
- 32. Calyces densely pilose with hairs 0.5-1.0 mm long; subalpine plants (3000-3500 m). .... 8. *S. calcicola*
- 32. Calyces sparsely strigose to subglabrous, the hairs 0.1-0.3 mm long; lower to mid-elevational montane plants (2000-3000 m, rarely higher). .... 30. *S. radicans*
- 33. Flowers mostly 1 or 2 to a node. .... 32. *S. rotundifolia*
- 33. Flowers mostly 4-8 to a node. .... (34)
- 34. Corolla tubes w/o an annulus. .... (35)
- 34. Corolla tubes annulate. .... (38)



35. Corolla tubes 7-8 mm long; Cerro El Potosí, Nuevo León. .... 38. *S. vulnerabilis*
35. Corolla tubes 5-7 mm long; not on Cerro El Potosí, Nuevo León. .. (36)
36. Calyces 3-4 mm long; southern Pueblo. .... 10. *S. collina*
36. Calyces 5-6 mm long; Chihuahua, Jalisco. .... (37)
37. Upper lip of corollas ca. 3 mm long; Jalisco. .... 4. *S. aristata*
37. Upper lip of corollas 5-6 mm long; Chihuahua. .... 22. *S. mohinora*
- 38(34). Stems prostrate, rooting at the nodes; leaves mostly 1.0-2.3 cm long. .... 31. *S. radicans*
38. Stems ascending to erect; leaves mostly 3-6 cm long. .... (39)
39. Corolla tubes 5.0-6.5 mm long; northern Nuevo León and northern Tamaulipas. .... 11. *S. drummondii*
39. Corolla tubes 6-11 mm long. .... (40)
40. Corolla tubes mostly 6-7 mm long. .... (41)
40. Corolla tubes mostly 7-11 mm long. .... (42)
41. Flowers mostly 6-10 to a node; Durango. .... 37. *S. venulosa*
41. Flowers mostly 4-6 to a node; Hidalgo. .... 15. *S. herrerana*
42. Petioles of midstem leaves mostly 3.5-4.5 cm long; Michoacán, México to Veracruz, Oaxaca, Chiapas, and Guatemala southwards. .... 28. *S. pilosissima*
42. Petioles of midstem leaves mostly 0.5-2.5 cm long. .... (43)
43. Calyx tubes 6-7 mm long; stems trailing to semi-erect; México state, Pueblo, Veracruz. .... 33. *S. sanchezii*
43. Calyx tubes 5-6 mm long; stems  $\pm$  erect; Nuevo León to Hidalgo. .. (44)
44. Calyx lobes mostly 3.0-3.5 mm long; the calyx tubes with hairs mostly 0.1-0.2 mm long; Hidalgo. .... 30. *S. pringlei*
44. Calyx lobes 2.0-2.8 mm long; calyx tube with hairs 0.4-0.8 mm long; Nuevo León. .... 20. *S. langmaniae*



1. *STACHYS AGRARIA* Cham. & Schlecht., *Linnaea* 5:100. 1830. TYPE: MEXICO. Veracruz: vicinity of Xalapa, 1819, *Schiede* 143 (HOLOTYPE: destroyed; Isotype: HAL).

*Stachys umbrosa* Scheele, *Linnaea* 22:595. 1849. TYPE: U.S.A. Texas: Comal Co., near New Braunfels, 1846-1847, *Roemer s.n.* (HOLOTYPE: not located).

*Stachys confusa* Briq., *Annuaire Conserv. Jard. Bot. Genève* 2:122. 1898. TYPE: U.S.A. Texas: "Brazos River", 1833-1835, *Drummond s.n.* (HOLOTYPE: G; Isotypes: GH!, K).

*Stachys polysegia* Briq., *Annuaire Conserv. Jard. Bot. Genève* 13:385. 1911. TYPE: MEXICO. Tamaulipas: near San Juan, 1902, *Kemp s.n.* (HOLOTYPE: NY).

*Stachys agraria* is a common annual weedy species over most of eastern Texas, extending eastwards into the southeastern U.S.A. and southwards into México (Figure 1) where it becomes quite variable, especially as to habit. It is usually readily identified by its small annulate corollas which barely emerge from their calyces. The above synonymy follows, in part, the account of Mulligan & Munro (1989). They note that some workers have used the name *S. crenata* Raf. for this taxon, which appears ill-advised since that name is poorly described and cannot be typified.

2. *STACHYS AJUGOIDES* Benth., *Linnaea* 6:80. 1831. TYPE: U.S.A. California: w/o specific locality, 1830, *Chamisso s.n.* (HOLOTYPE: K).

*Stachys mexicana* Moçño & Sessé ex Benth., *Lab. Gen. & Sp.* 541. 1834. (cf. Mulligan & Munro 1989, re typification).

*Stachys rigida* Nutt. ex Benth. in DC., *Prodr.* 12:472. 1848. TYPE: U.S.A. Oregon/Washington (?): Columbia River, 1810-1812, *Nuttall s.n.* (LECTOTYPE: PHIL, designated by Mulligan & Munro 1989, although the lectotype should reside at K).

This widespread, variable species of westernmost U.S.A. extends into northern Baja California (Figure 4). Mulligan & Munro (1989) recognized the Mexican material as belonging to *Stachys rigida*, as did Epling (1935). I follow the treatment of Anderson & Tanowitz (1994) in the Jepson Manual, who subsume *S. rigida* (and its numerous segregates and synonyms) and *S. mexicana* under *S. ajugoides*.

Epling (1935) placed *Stachys ajugoides* in his group "X" of *Stachys*, which was largely distinguished by its saccate corollas with an oblique annulus. The relationship of the group was thought to be with European species (as opposed



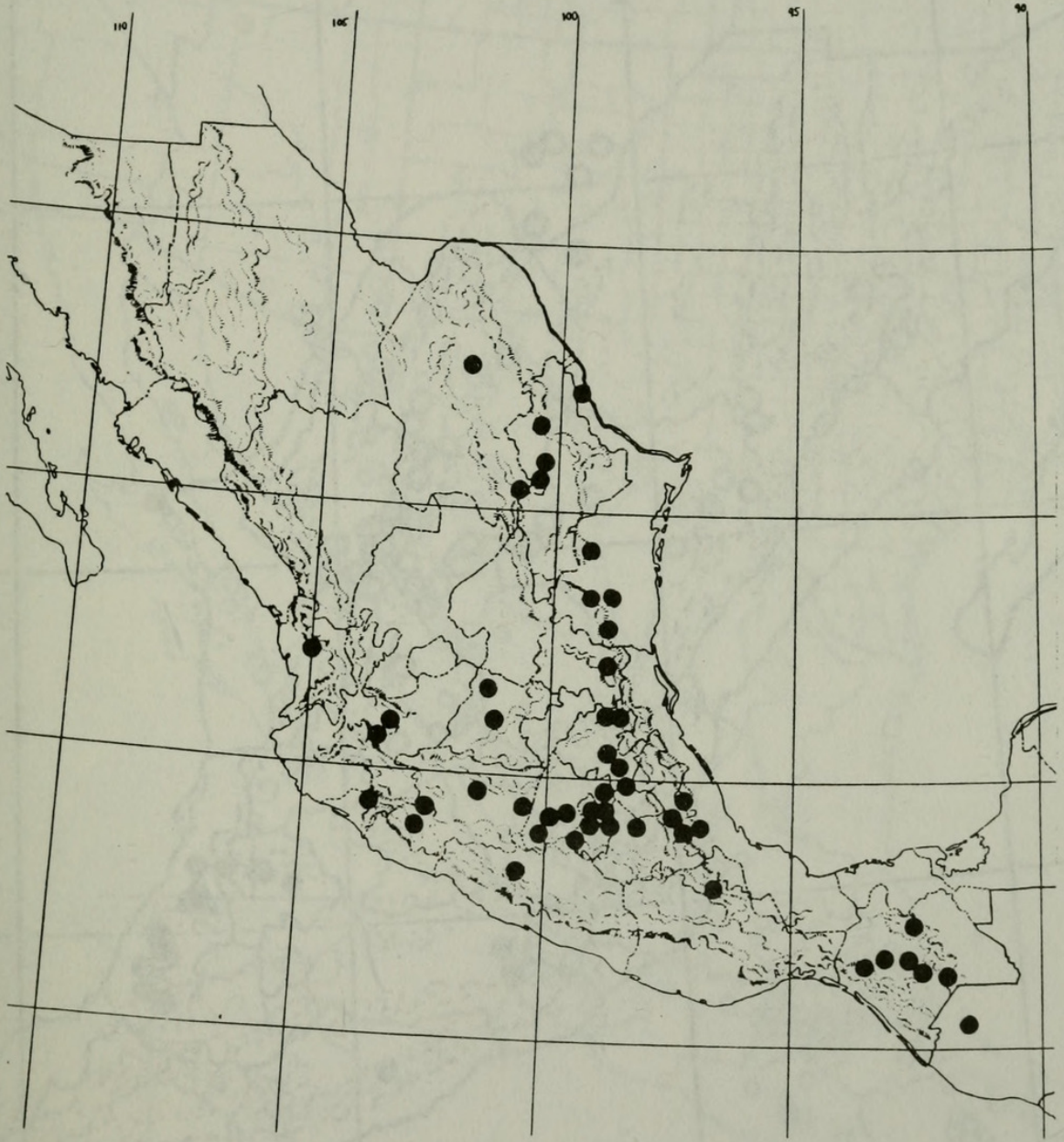


Figure 1. Distribution of *Stachys agraria* in México.



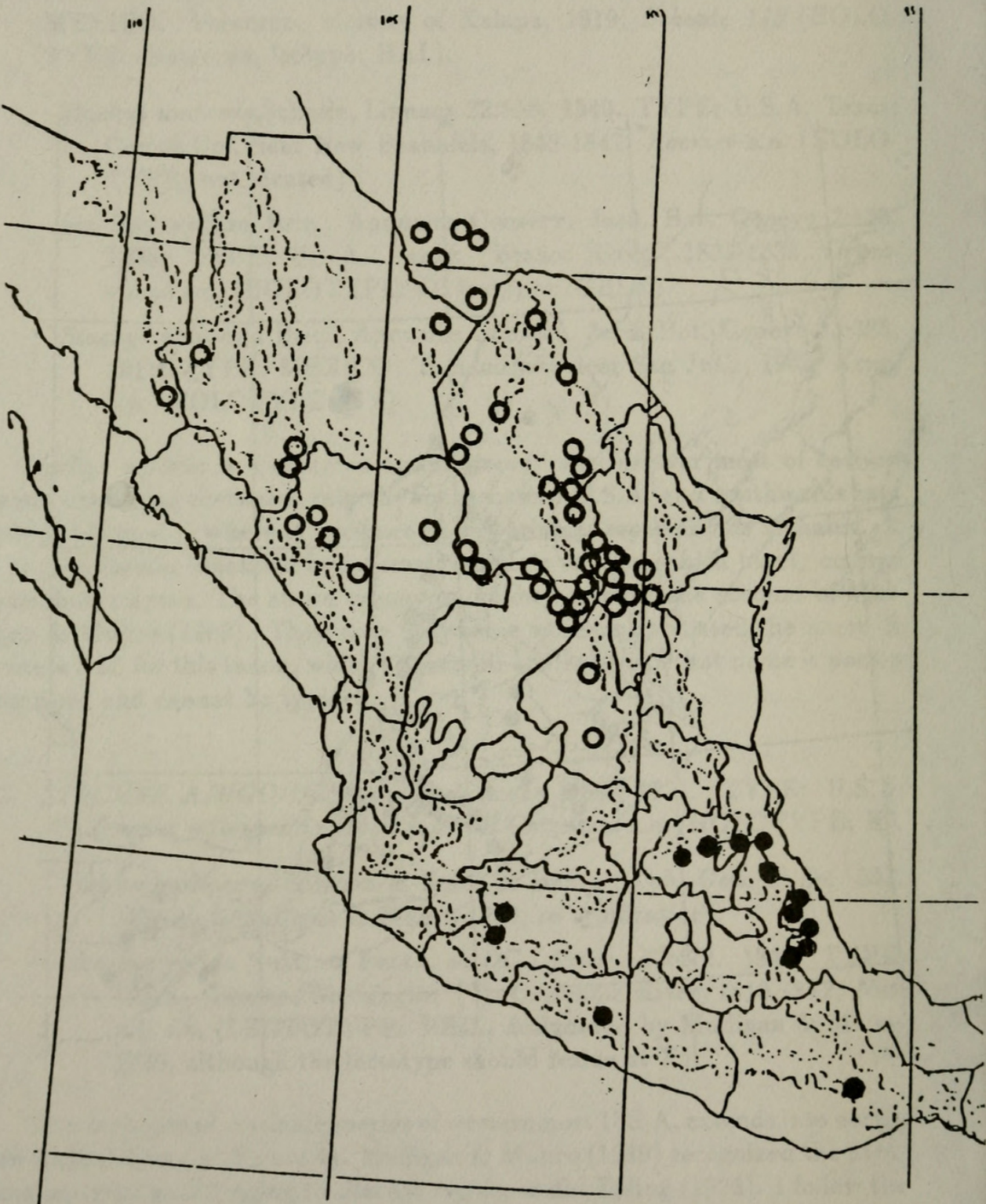


Figure 2. Distribution of *Stachys bigelovii* (open circles); *S. boraginoides* (closed circles).



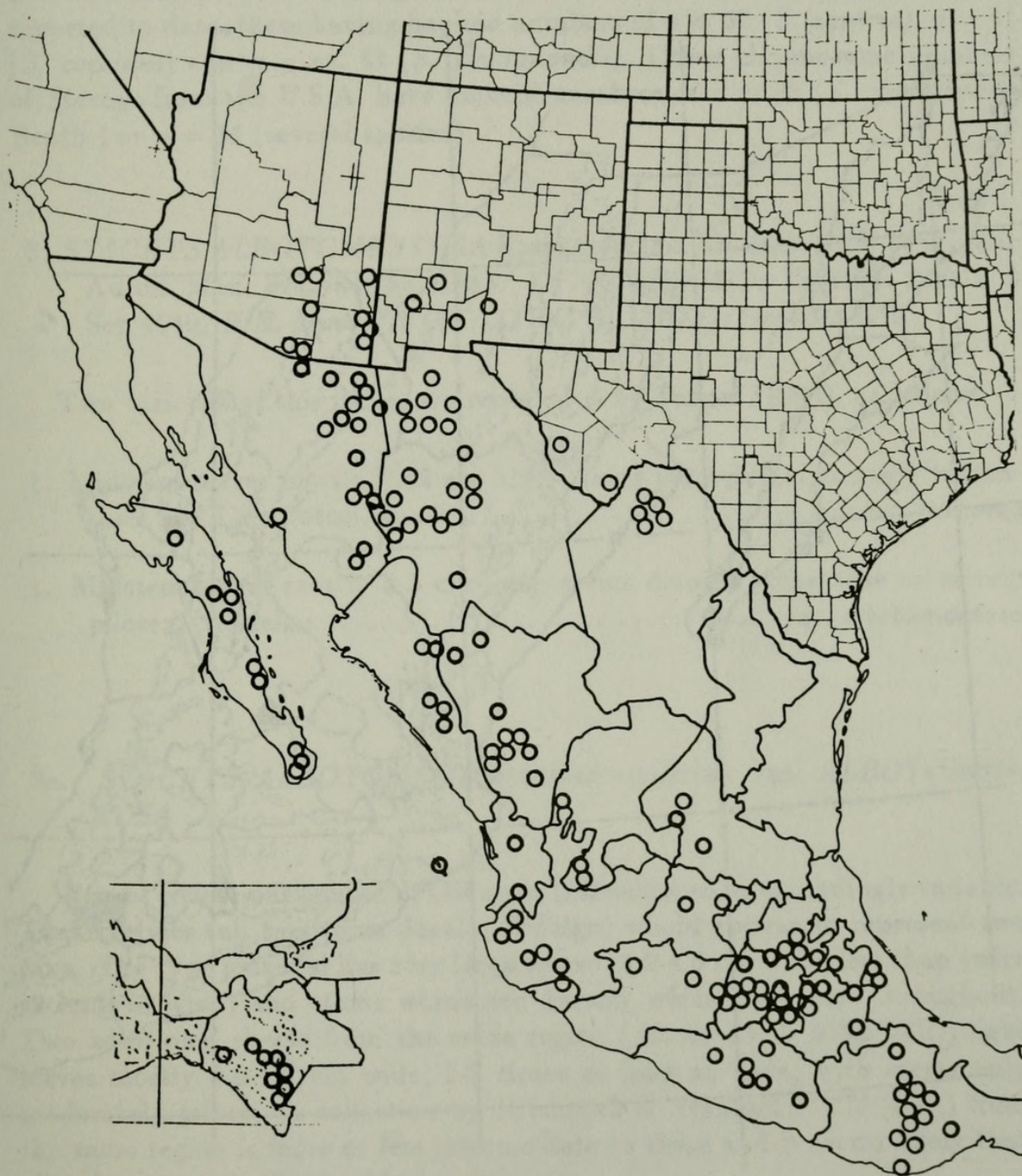


Figure 3. Distribution of *Stachys coccinea* in México and U.S.A.



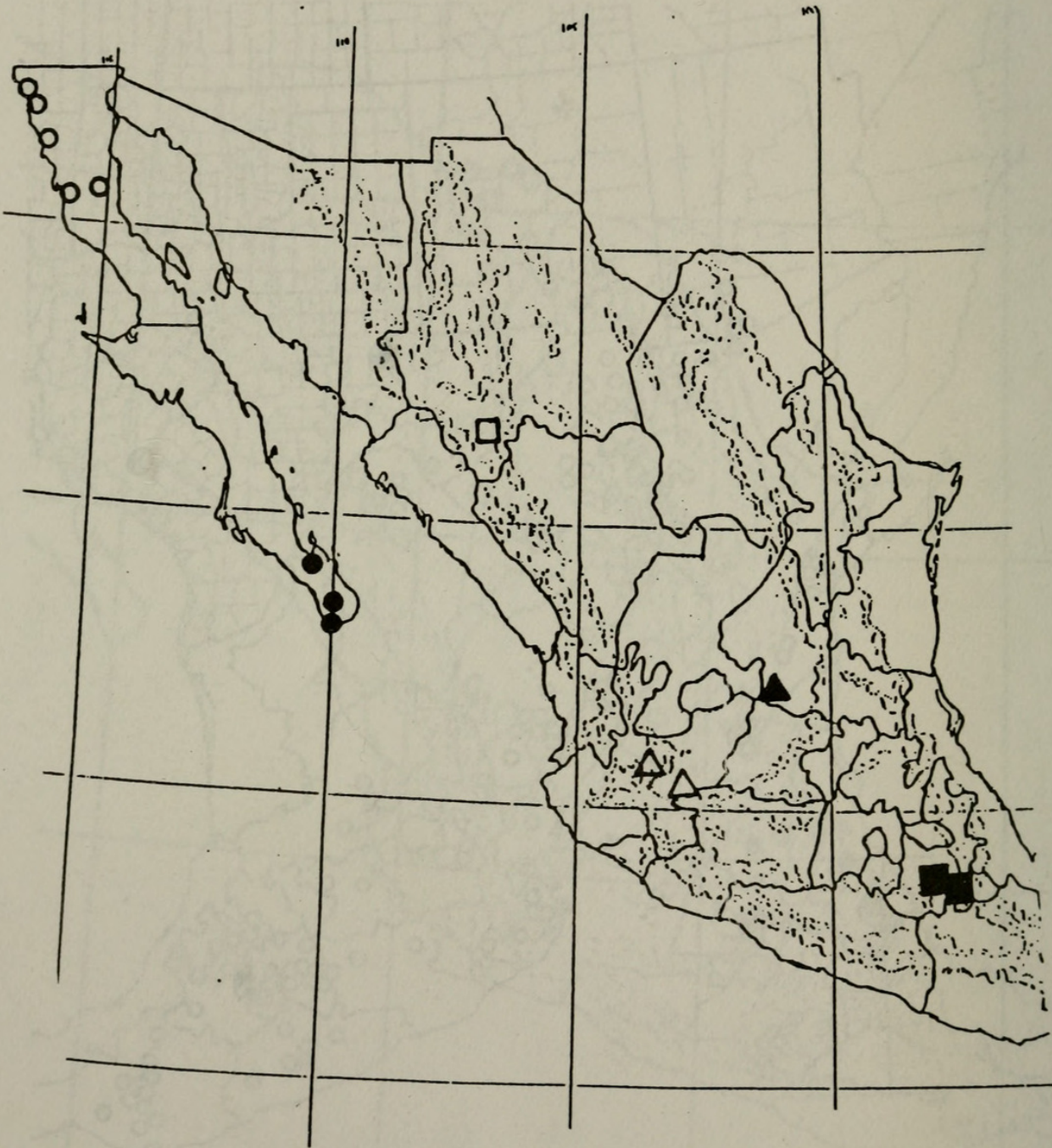


Figure 4. Distribution of *Stachys ajugoides* (open circles), *S. arriagana* (closed triangle), *S. aristata* (open triangles), *S. collina* (closed squares), *S. mohinora* (open square), and *S. tenerrima* (closed circles).



to Mexican). Mulligan & Munro (1989) reported haploid chromosome counts of  $n = 33$  for *S. ajugoides* and seven other closely related species (including *S. mexicana*), this contrasting with the few Mexican taxa which have been reported to date, these having haploid numbers of  $n = 32$  (*S. agraria*),  $n = 41$  (*S. coccinea*) and  $n = \text{ca. } 41$  (*S. drummondii*). Other chromosome numbers of *Stachys* from the U.S.A. have haploid numbers of  $n = 32$  (*S. chamissonis* Benth.) or  $n = 34$  (several species).

3. *STACHYS ALBOTOMENTOSA* Ramamoorthy, An. Inst. Biol. Univ. Nac. Auton. Mex. Bot. 34:158. 1987. TYPE: MEXICO. Hidalgo: Jacala, 9 Sep 1940, *H.E. Moore 12* (HOLOTYPE: MEXU; Isotype: GH!).

Two varieties of this taxon are recognized by Turner (1994), as follows:

1. Midstem leaves mostly 8-12 cm long; stems silky-pilose, scarcely tomentose; San Luis Potosí. .... var. *potosina*
1. Midstem leaves mostly 3-5 cm long; stems densely tomentose to merely pilose; N Hidalgo. .... var. *albotomentosa*

- 3a. *STACHYS ALBOTOMENTOSA* Ramamoorthy var. *ALBOTOMENTOSA*

Recent collections housed at GH show this taxon to be exceedingly variable. The extremes (all from near Jacala, Hidalgo) would appear to represent two taxa. The type material has very large leaves (4.0-4.5 cm wide, less than twice as long as wide) and stems which are densely white-tomentose throughout. Two additional sheets from the same region (*Moore 1316, 3794* [GH]) have leaves mostly 1.0-1.5 cm wide, 2-3 times as long as wide, with stems only moderately pilose. A collection by Hitchcock & Stanford (7278 [GH]) from the same region is more or less intermediate to these and it seems likely that all belong to a single variable taxon.

- 3b. *STACHYS ALBOTOMENTOSA* Ramamoorthy var. *POTOSINA* B.L. Turner, Phytologia 76:343. 1994. TYPE: MEXICO. San Luis Potosí: 30 mi E of San Luis Potosí along Hwy 86 to Río Verde, rocky open oak-wooded hillside, 13 Jul 1963, *R.L. McGregor 631*, with L.J. Harms, A.J. Robinson, R. del Rosario, & R. Segal (HOLOTYPE: LL!).



Turner (1994) cited additional collections, all from a small area to the east of San Luis Potosí. The biological status of this taxon is moot, considering the variation now known to exist in var. *albotomentosa* in the area about Jacala, Hidalgo, discussed in the above. Either a single variable taxon is involved or several localized varietal taxa.

4. *STACHYS ARISTATA* Greenm., Proc. Amer. Acad. Arts 39:87. 1903. TYPE: MEXICO. Jalisco: River ledges along the cataract of Guanacatlán, 6 Aug 1902, C.G. Pringle 8623 (HOLOTYPE: GH!; Isotype: LL!).

This taxon is known by relatively few collections, all from the state of Jalisco (Figure 4). It superficially resembles *Stachys bigelovii* A. Gray and *S. mohinora* B.L. Turner, both of which occur in northwestern México, but both of the latter have nonannulate corollas; the holotype of *S. aristata* possesses a well-developed annulus in the corolla tube, although Epling described the corollas as exannulate.

5. *STACHYS ARRIAGANA* B.L. Turner, *sp. nov.* TYPE: MEXICO. San Luis Potosí: Mpio. Villa de Arriaga, Rancho "El Palmar", Potrero "Tortugas", al SO del Edo., "Materral crassicaule con nopalera. Suelo litosol eutrico.", 2150 m, 22 Jul 1983, I.V. Rivas M. & M. Gonzáles E. 62 (HOLOTYPE: TEX!).

*Stachydi moorei* B.L. Turner similis sed foliis multo majoribus (4-6 cm longis vs. 8-13 cm longis) et floribus calycibus majoribus (9-10 mm longis vs. 6-7 mm longis) et tubis corollarum majoribus (10-11 mm longis vs. 4.5-5.5 mm longis).

Perennial erect or ascending herbs 60-70 cm high. Midstems 3-4 mm thick, decidedly herbaceous, minutely recurved-pilose throughout, the vestiture ca. 0.25 mm high. Midstem leaves thin, mostly 8-13 cm long, 3-4 cm wide; petioles 3-4 cm long; blades broadly ovate to subcordate, minutely but sparsely pubescent on both surfaces, the margins crenate. Flowers 6 to a node, axillary, the broad thin leaves much exceeding the flowering clusters, the pedicels ca. 1 mm long. Calyces 9-10 mm long; tubes 5.0-5.5 mm long, minutely hirsutulous with both glandular and eglandular hairs; lobes 4-5 mm long, linear-lanceolate, gradually tapering into terminal stiff awns. Corollas reportedly "de color lila", the tubes arcuate, 10-11 mm long, not annulate within, the upper lips 2.5-3.0 mm long, the lower lips ca. 6 mm long. Stamens 4, subequal, the filaments 4-5 mm long, pubescent, the anthers purple, exserted for 2-3 mm. Ovary



pubescent apically with 30-50 stiff hairs ca. 0.25 mm long, otherwise glabrous. Nutlets immature.

What with its pubescent nutlets, there is little doubt that this taxon relates to *Stachys moorei* B.L. Turner, described below. It is readily distinguished from the latter by its much larger leaves, calyces and corollas, as noted in the key to species.

6. *STACHYS BIGELOVII* A. Gray, Proc. Amer. Acad. Arts 8:371. 1872. TYPE: U.S.A. Texas: Jeff Davis Co., "Crevices of rocks (basaltic), Mountains of the Limpio, Texas", [Limpia Creek, near Fort Davis], 13 Jun 1851, *C. Wright 1535* (LECTOTYPE [designated here]: GH!; Isolectotypes: GH!, NY). Mulligan & Munro (1989), incorrectly I think, placed the holotype at NY; from the two sheets at GH I have selected the specimen bearing Gray's annotation, "*Stachys bigelovii* n. sp.", as lectotype, the other sheet lacking such notation.

This relatively uniform taxon occurs in northcentral México and closely adjacent U.S.A. (Figure 2). It superficially resembles *Stachys aristata*, *S. langmaniae* Rzed. & Rzed., and *S. vulnerabilis* Rzed. & Rzed. but is readily distinguished from all of these by having longer nonannulate corollas.

7. *STACHYS BORAGINOIDES* Cham. & Schlecht., Linnaea 5:100. 1830. TYPE: MEXICO. Veracruz: vicinity of Xalapa, May 1829, *Schiede 144* (LECTOTYPE: B, selected by Epling!, 1934, now destroyed).

*Stachys boraginoides* Cham. & Schlecht. var. *glandulosa* Greenm., Proc. Amer. Acad. Arts 41:245. 1905. TYPE: MEXICO. Hidalgo: barranca below Trinidad, 5 May 1904, *C.G. Pringle 8894* (HOLOTYPE: GH!; Isotypes: CAS!).

This taxon is readily recognized by its decumbent or trailing habit, relatively large rose-lavender to purple corollas, and broad-based stem hairs; 8 specimens from the state of Veracruz have all of these characters, but those from Guerrero (e.g., *Hinton 14108* [F, TEX]) and Michoacán (e.g., *Hinton 15501* [F, TEX]), while possessing similar habits and corollas, do not have markedly broad-based hairs, and their calyx lobes are mostly 2-3 mm long (vs. 3-5 mm). These more western populations may represent a different taxon.

8. *STACHYS CALCICOLA* Epling, Bull. Torrey Bot. Club 71:484. 1944. TYPE: GUATEMALA. Huehuetenango: vicinity of Chemal, summit of Sierra de los Cuchumatanes, 3700-3750 m, 8 Aug 1943, *J. Steyermark 50266* (HOLOTYPE: UC-UCLA; Isotype: F!).



Epling (1944) and Standley & Williams (1973) recognized this species. It much resembles *Stachys radicans* Epling and may be but a short-shooted form of that taxon. Interestingly, Epling (1944) recognized both *S. calcicola* and *S. radicans* as occurring in alpine areas in the Sierra de los Cuchumatanes, but Standley & Williams recognized only the former. It is likely that additional study will show the two taxa to be the same.

9. *STACHYS COCCINEA* Ort., *Nov. Pl. Descr.* Dec. 20, 1797. TYPE: MEXICO. Grown in Spain from seed reportedly collected in Cuba by Sessé (HOLOTYPE: MA; Probable isotype: F! [Ex antiquo herbaria generali, Hort Madrid ex "Nova Hispania"]). Since this taxon does not occur in Cuba, it is likely that the type was obtained in México.

Turner (1994) has provided complete synonymy in a revisionary treatment of the *Stachys coccinea* complex which includes *S. albotomentosa*, *S. jaime-hintonii* B.L. Turner, *S. lindenii* Benth. in DC., and *S. pacifica* B.L. Turner. The distribution maps for these taxa in the present paper show additional collections from GH.

10. *STACHYS COLLINA* Brandege, *Univ. Calif. Publ. Bot.* 3:391. 1909. TYPE: MEXICO. Puebla: near San Luis Tultitlanapa, Jun 1908, *Purpus* 2576 (HOLOTYPE: UC!; Isotypes: F!, GH!). An isotype (F) bears the date "July 1907-8."

This taxon, known only from southern Puebla (Figure 4), superficially resembles *Stachys grahamii* Benth. but is readily distinguished from it by having much longer midstem and inflorescence internodes, leaves somewhat velvety-puberulous beneath, and corollas with an annulus 2.5-3.0 mm above the base (vs. 1.0-1.5 mm above the base). Epling (1934) described the upper lips of *S. collina* as being 3-4 mm long, but the sheets I examined, including several annotated by Epling, reveal the upper lips to be 2.5-3.0 mm long.

11. *STACHYS DRUMMONDII* Benth., *Lab. Gen. et Sp.* 551. 1834. TYPE: U.S.A. Texas: "Brazos River" [probably in westernmost Harris Co.], 1833, *Drummond s.n.* (HOLOTYPE: K).

Only two collections of this species are known from México (Tamaulipas, San José, 17 Feb 1939, *Le Sueur* 407 [TEX]; and Nuevo León, near Monterrey, *Ferguson* 7 [TEX]), although it is abundant along the Rio Grande River on the Texas side (Hidalgo and Cameron counties).



*Stachys drummondii* much resembles *S. grahamii* but is distinguished from the latter by having longer upper lips of the corollas, longer calyx lobes (mostly 3.5-4.5 mm vs. 2.0-3.0 mm) and longer-petiolate leaves.

12. *STACHYS ERIANTHA* Benth., *Lab. Gen. et Sp.* 549. 1834. TYPE: MEXICO. w/o locality but probably México State, 1797-1801, *Moçino & Sessé s.n.* (HOLOTYPE: reportedly in the Lambert Herb.).

*Stachys repens* Mart. & Gal., *Bull. Acad. Brux.* 11, ser. 2:194. 1844. TYPE: MEXICO. Veracruz: Vaqueria del Jacal, 10,000 ft, Jun-Oct 1840, *Galeotti 682* (LECTOTYPE [selected here]: BR!; Isolectotype: K). Type material at BR (3 sheets!) consists of mixed material, all with the collection number 682 of Galeotti.

Epling (1934) treated *Stachys repens* as a synonym of *S. eriantha* but Zuniga (1985) retained the former without explanation. After examination of type material of *S. repens* I agree with Epling's assessment. It would appear that the two names both apply to the high elevational (3000-4000 m) populations of *Stachys* having prostrate stems, relatively small leaves and corollas with tubes lacking a well-defined basal annulus. The latter character readily separates *S. eriantha* from the superficially similar *S. radicans*.

As noted in the above synonymy, three sheets of *Galeotti 682* were located at BR. One of these gave as its locality "Pie d' Orizaba", 9000 ft, August 1840; this specimen was designated as the type by Epling (1934). A second sheet's label bore as its locality "Vaqueria del Jacal", 18,000 ft, Jun-Oct 1840; this sheet was examined by John Beaman in 1963 and annotated "apparently the holotype of *Stachys repens* Mart. & Gal." A third sheet bearing the number 682 but without additional specific data, was annotated by Epling in 1938 as an isotype. The latter would have been a good selection for the lectotype since it bore mature flowers (the other two sheets essentially sterile), but there is no evidence that the authors of *S. repens* actually saw the sheet concerned. All of these are unquestionably the same species but I have selected as lectotype that sheet singled out by Beaman as "holotype".

13. *STACHYS GLOBOSA* Epling, *Repert. Spec. Nov. Regni Veg. Beih.* 80:24. 1935. TYPE: MEXICO. San Luis Potosí: vicinity of Las Canoas, 15 Jul 1890, *C.G. Pringle 3217* (HOLOTYPE: UC-UCLA; Isotypes: F!, GH!).

I have separated specimens from western San Luis Potosí, which were treated by Epling as belonging to this taxon, calling these *Stachys sander-sii* B.L. Turner (discussed in more detail under the latter name).



14. *STACHYS GRAHAMII* Benth., *Lab. Gen. et Sp.* 551. 1834. TYPE: MEXICO. México State: vicinity of Tlalpuxahua, 1830, *Graham 106* (HOLOTYPE: K).

*Stachys parvifolia* Mart. & Gal., *Bull. Acad. Brux.* 11, ser. 2:193. 1844. TYPE: MEXICO. Hidalgo: Real del Monte, 8000 ft, Jun-Oct 1840, *H. Galeotti 701* (HOLOTYPE: BR!).

?*Stachys biflora* Hook. & Arn., *Bot. Voy. Beechey* 155. 1841. TYPE: MEXICO. Nayarit(?): 1817-1828, *Lay & Collie s.n.* (HOLOTYPE: K).

*Stachys agraria* Cham. & Schlecht. var. *glabrior* Benth. in DC., *Prodr.* 12:479. 1848. TYPES: MEXICO. Nayarit(?): 1845-1840, *Hartweg 167* (HOLOTYPE: K).

*Stachys camporum* M.E. Jones, *Contr. W. Bot.* 12:70. 1908. TYPE: MEXICO. Chihuahua: Mound Valley, 18 Sep 1903, *M.E. Jones s.n.* (HOLOTYPE: CSPU; Isotypes: CAS!, GH!).

*Stachys latipes* Greenm., *Proc. Amer. Acad. Arts* 39:87. 1903. TYPE: MEXICO. Chihuahua: near Colonia García, 8000 ft, 17 Jul 1899, *H.T. Townsend & Barber 128* (HOLOTYPE: GH!; Isotype: F!).

Zuniga (1985) considered *Stachys grahamii* to be a synonym of *S. agraria*. I follow Epling (1935) in recognizing *S. grahamii*, distinguishing it from *S. agraria* by its seemingly perennial habit and larger corollas, the lips large and tubes well-exserted from the calyx. Both taxa are more or less sympatric (Figure 1 and Figure 7) but *S. agraria* is a more delicate plant than *S. grahamii*, having thinner, broader, leaves and much smaller corollas, as already noted. Epling (1934), Epling & Játiva (1966), and Zuniga (1985) maintained *S. parvifolia* but after examining its type I conclude that the latter name is a synonym of *S. grahamii*. Epling keyed *S. grahamii* and *S. parvifolia* next to each other, distinguishing the latter by its unequal stamens (vs. subequal), characters which I could not find reliable.

15. *STACHYS HERRERANA* Rzed. & Rzed., *Acta Bot. Mex.* 3:1. 1988. TYPE: MEXICO. Hidalgo: Mpio. de Epazoyucan, 1 km al S de El Guajolote, 3800 m, 25 Aug 1984, *Rzedowski 38464* (HOLOTYPE: ENCB; Isotype: TEX!).

Known only from type material, this species is readily recognized by its relatively narrow  $\pm$  dentate leaves and corollas with large upper lips.



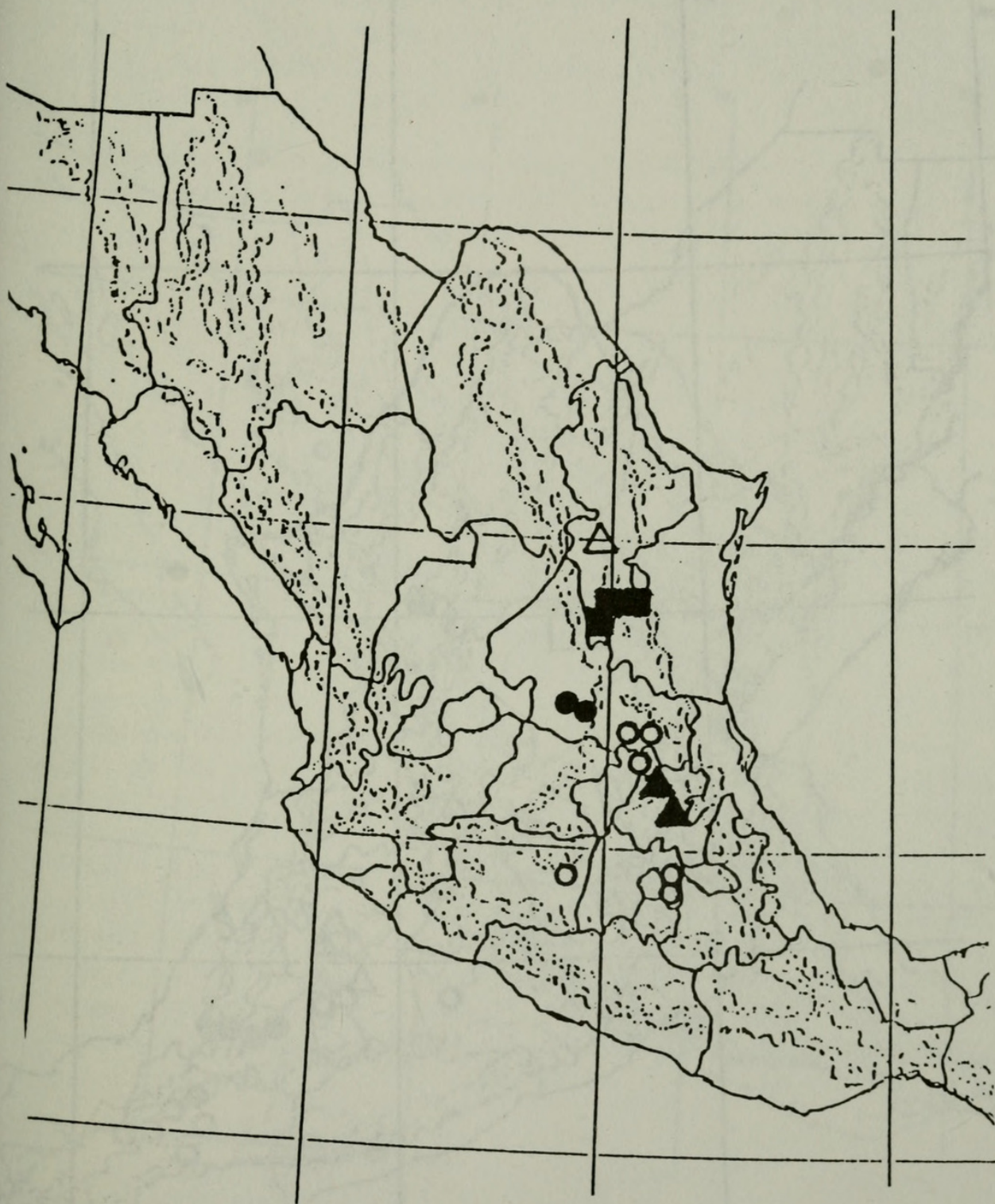


Figure 5. Distribution of *Stachys globosa* (open circles), *S. langmaniae* (closed square), *S. moorei* (closed triangle), *S. sandersii* (closed circles), and *S. vulnerabilis* (open triangle).



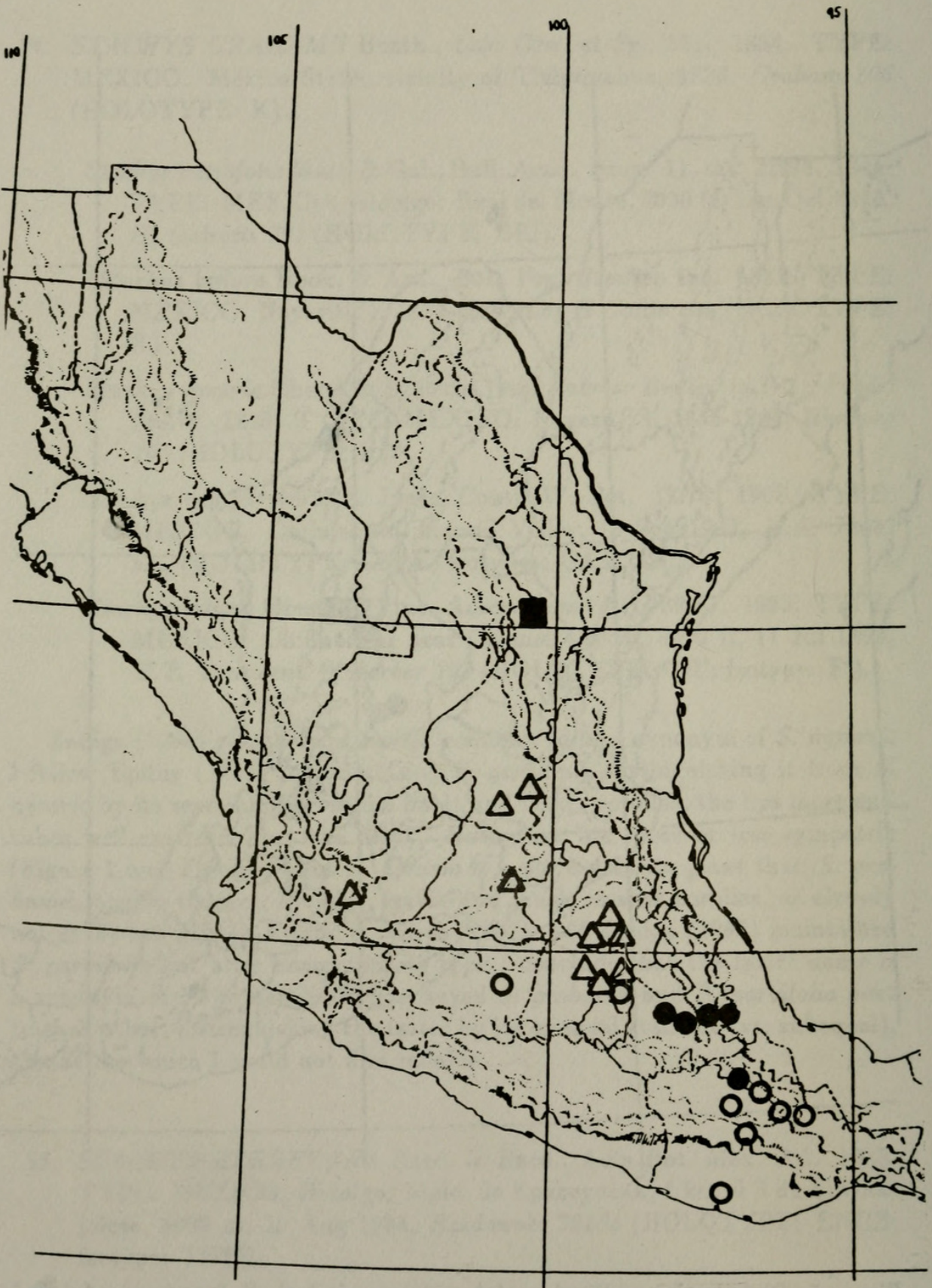


Figure 6. Distribution of *Stachys hintoniorum* (closed square), *S. inclusa* (closed circle), *S. keerlii* (open circles), and *S. nepetifolia* (open triangles).



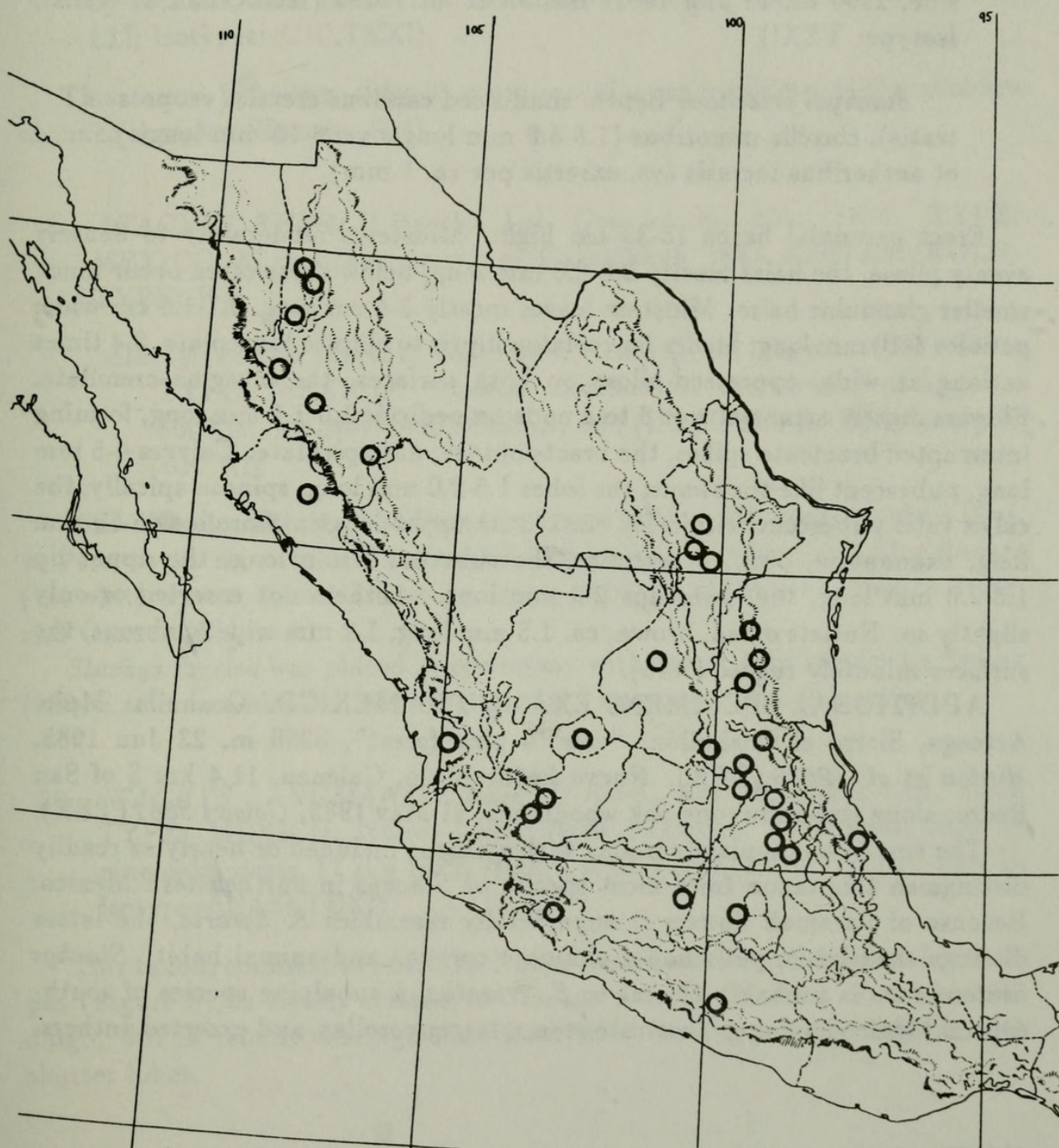


Figure 7. Distribution of *Stachys grahamii* (open circles).



16. **STACHYS HINTONIORUM** B.L. Turner, *sp. nov.* TYPE: MEXICO. Nuevo León: Mpio. Galeana, Sierra La Marta, rocky mountain side, 2900 m, 13 Jun 1981, *Hinton et al. 18294* (HOLOTYPE: TEX!; Isotype: TEX!).

*Stachydi erianthae* Benth. similis sed caulibus erectis (vs. prostratis), corollis minoribus (1.5-5.0 mm longis vs. 8-10 mm longis), et antheribus inclusis (vs. exsertis per ca. 1 mm).

Erect perennial herbs 15-35 cm high. Midstems moderately to densely evenly pilose, the hairs mostly 0.8-2.0 mm long, below these often occur much smaller glandular hairs. Midstem leaves mostly 3-4 cm long, 0.7-1.5 cm wide; petioles 4-10 mm long; blades lanceolate-elliptic to elliptic-lanceolate, 3-4 times as long as wide, appressed-pilose on both surfaces, the margins crenulate. Flowers mostly arranged 4 or 6 to a node on pedicels 1.0-1.5 mm long, forming interrupted bracteate spikes, the bracts obtuse, not apiculate. Calyces 4-5 mm long, pubescent like the stems, the lobes 1.5-2.0 mm long, spinose apically, the calyx tube pubescent within for ca. 1/3 its upper length. Corollas 4.5-5.0 mm long, exannulate, pink to lavender, the tube ca. 3 mm long, the upper lip 1.5-2.0 mm long, the lower lips 2-3 mm long. Anthers not exserted or only slightly so. Nutlets ovoid, brown, ca. 1.5 mm long, 1.2 mm wide, glabrous, the surfaces minutely rugose ( $\times 40$ ).

ADDITIONAL SPECIMENS EXAMINED: MEXICO. Coahuila: Mpio. Arteaga, Sierra el Coahuilón, "vale in pine forest", 3250 m, 23 Jun 1985, *Hinton et al. 18885* (TEX). Nuevo León: Mpio. Galeana, 11.4 km S of San Pedro, along stream in pine-oak woodlands, 31 May 1983, *Cowan 3861* (TEX).

The small nonannulate corollas with stamens included or nearly so readily distinguish this taxon from most species of *Stachys* in northeastern México. Because of its small flowers it superficially resembles *S. agraria*, the latter distinguished by its yet smaller annulate corollas and annual habit. *Stachys hintoniorum* is probably closest to *S. eriantha*, a subalpine species of south-central México having  $\pm$  prostrate stems, larger corollas, and exserted anthers.

17. **STACHYS INCLUSA** Epling, Repert. Spec. Nov. Regni Veg. Beih. 80:25. 1935. TYPE: MEXICO. Puebla: vicinity of Mayorazgo, 2120 m, 4 Jul 1907, *Arsene 1338* (HOLOTYPE: US; Isotype: MO).

This taxon is known only from southern Puebla and closely adjacent Oaxaca (Figure 6). It superficially resembles *Stachys agraria* but is readily distinguished by its strongly perennial habit, larger nonannulate corollas, and included stamens.



18. *STACHYS JAIMEHINTONII* B.L. Turner, *Phytologia* 76:395. 1994. TYPE: MEXICO. Michoacán: Zitácuaro, Salto de Nandia, bushy bank by orchard, 1500 m, 26 Dec 1938, *Jaime Hinton 13489* (HOLOTYPE: LL!; Isotypes: GH!, TEX!).

This taxon is known only by type material and relates to the *Stachys coccinea* complex (Turner 1994).

19. *STACHYS KEERLII* Benth., *Lab. Gen. et Sp.* 551. 1834. TYPE: MEXICO. Michoacán: vicinity of Tlalpujahua, 1833, *Keerl s.n.* (HOLOTYPE: K).

*Stachys excelsa* Mart. & Gal., *Bull. Acad. Brux.* 11, ser. 2:194. 1844. TYPE: MEXICO. Oaxaca: savannas in the vicinity of Juquila, 8000 ft, Sep-Nov 1840, *Galeotti 662* (HOLOTYPE: BR!; Isotypes: BR!, K!).

This taxon is distinguished from the closely related *Stachys nepetifolia* Desf. ex Pers. by its short corolla tubes (4-5 mm long vs. 6-8 mm) and lilac flowers (vs. white or rose-colored). It is known to occur in Michoacán, México State, and Oaxaca (Figure 6).

*Stachys excelsa* was placed in synonymy with the present species by Epling (1934); after examination of type material I agree with his disposition.

20. *STACHYS LANGMANIAE* Rzed. & Rzed., *Acta Bot. Mex.* 3:1. 1988. TYPE: MEXICO. Nuevo León: Mpio. Zaragoza, Encantada, 2320 m, pine-oak forests, 17 Jun 1979, *Hinton et al. 17545* (HOLOTYPE: ENCB; Isotypes: CAS!, TEX!).

This taxon, confined to southern Nuevo León and closely adjacent Tamaulipas (Figure 5), is closely related to *Stachys pringlei* Greenm. of western Hidalgo, but is readily distinguished from it by having smaller calyces with shorter lobes.

21. *STACHYS LINDENII* Benth., in DC., *Prodr.* 12:467. 1848. TYPE: MEXICO. Tabasco: vicinity of Teapa, 1843-1844, *Linden 127* (LECTOTYPE: K, selected by Epling 1934).

This taxon belongs to the *Stachys coccinea* complex and is treated in more detail by Turner (1994). Epling (1934) designated from among three different collections examined, *Linden 127* as lectotype; Munro (by annotation) erroneously labeled this sheet as "holotype".



22. **STACHYS MOHINORA** B.L. Turner, *sp. nov.* TYPE: MEXICO. Chihuahua: summit of Sierra Mohinora, in conifer forest, 10,000-10,300 ft, 16-17 Oct 1959, *D.S. Correll & H.S. Gentry 23181* (HOLOTYPE: LL!).

*Stachydi vulnerabili* Rzed. & Rzed. similis sed calycibus apiculatis (vs. spinosis) minoribus (5-6 mm longis vs. 7-8 mm longis) lobis latoribus (loborum latitudine longitudinem aequanti vs. lobis 2-3 plo longioribus quam latoribus) et corolla absque annule prope basim interiorem tubi differt.

Perennial erect or ascending herbs 10-30 cm high. Midstems 1-2 mm across, sparsely to moderately pilose with hairs 0.5-1.0 mm long. Midstem leaves mostly 3-6 cm long, 1.5-2.5 cm wide; petioles 0.8-2.0 cm long; blades ovate to subdeltoid, pilose beneath like the stems, the margins crenate. Flowers 4-6 to a node, arranged in terminal bracteate interrupted spikes, the pedicels ca. 1 mm long. Calyces 5-6 mm long; tubes 3.0-3.5 mm long, pilose like the stems; lobes triangular, about as wide as long, apiculate, scarcely spinose. Corollas reportedly "salmon-red"; tubes 7-8 mm long, not annulate within; upper lips ca. 4 mm long; lower lips 7-9 mm long. Nutlets ovoid, brown, ca. 3 mm long, 1.5 mm wide, glabrous, the surface minutely rugose ( $\times 40$ ).

ADDITIONAL COLLECTION EXAMINED: MEXICO. Chihuahua: Mpio. Guadalupe y Calvo, Cerro de Mohinora, Sierra de Guadalupe y Calvo, 3300 m, 27 Aug 1987, *McDonald & Martínez 2387* (TEX).

This subalpine taxon is seemingly most closely related to the recently described *Stachys vulnerabilis*, a subalpine endemic confined to Cerro Potosí, Nuevo León. *Stachys mohinora* is readily distinguished from *S. vulnerabilis* in having smaller calyces (5-6 mm long vs. 6-7 mm long) with broader lobes (ca. as long as broad), and apiculate apices (vs. 2-3 times as long as broad with spinose tips).

23. **STACHYS MOOREI** B.L. Turner, *sp. nov.* TYPE: MEXICO. Hidalgo: District Metztitlán, "Steep rocky, volcanic outcrops at head of descent into Barranca de Metztitlán, between Zoquital and Los Venados," ca. 2000 m, 31 Jul 1948, *H.E. Moore & C.E. Wood, Jr. 4199* (HOLOTYPE: TEX!).

*Stachydi grahamii* Benth. similis sed floribus 6 per nodum (vs. 8-10) et nuculis valde pubescentibus ad apices (vs. glabris).

Perennial (?) erect suffruticose herbs 30-50 cm high. Midstems ca. 2 mm thick, brittle, moderately pilose with spreading hairs 0.5-1.0 mm long. Midstem leaves thin, 4-6 cm long, 1.7-2.5 mm wide; petioles mostly 2.0-3.5 cm



long; blades broadly ovate to triangular, rarely subcordate, sparsely pilose beneath, 3-nervate, the margins crenate. Flowers 6 to a node, arranged in terminal bracteate interrupted spikes, their pedicels 1-2 mm long. Calyces 6-7 mm long; tubes 3-4 mm long, pilose with both eglandular and glandular hairs, the lobes lanceolate, 2.5-3.5 mm long, gradually narrowed to a terminal spine. Corollas reportedly "pink", the tubes 5-9 mm long, not annulate within, the upper lips 2.5-3.5 mm long, the lower lips 4-6 mm long. Stamens 4, subequal, the filaments ca. 2.5 mm long, pubescent, the anthers purple, exserted for ca. 1.5 mm. Ovary markedly pubescent at the apex with 40-60 trichomes ca. 0.25 mm long, otherwise glabrous. Nutlets (immature), broadly oblanceolate in outline, glabrous, ca. 2 mm long, 1.2 mm wide.

ADDITIONAL COLLECTION EXAMINED: MEXICO. Hidalgo: Mpio. Zimapan, 12 km N of Zimapan, ca. 170 m, 5 Sep 1979, *Hernández M. 3672* (CAS).

*Stachys moorei* superficially resembles *S. grahamii*, and the holotype was annotated in 1965 with that name by Epling (albeit with a query). It differs from all other Mexican species of my acquaintance except for *S. arriagana*, described above, in having a markedly pubescent ovary, the erect stiff hairs persisting upon the young nutlets. The specimen from near Zimapan has corolla tubes nearly twice as long as type material, otherwise the two collections cited are very similar.

It is a pleasure to name this taxon for Dr. H.E. Moore, longtime Professor at Cornell University and ardent collector in Hidalgo, México.

24. *STACHYS NEPETIFOLIA* Desf. ex Pers., *Syn. Pl.* 2(1):123. 1807. TYPE: MEXICO. México State (?): probably collected by Sessé & Moçino during the period 1797-1801; presumably grown in the Royal Botanical Garden Madrid, from whence dried plants were distributed (HOLOTYPE: P?).

*Stachys nepetifolia* Cav., *Descr. Pl.* 1:74. 1802. TYPE: probably original source of above material, but this is uncertain (HOLOTYPE: MA).

Epling (1935) included this name as questionably synonymous with *Stachys nepetifolia* Desf. ex Pers., but I suspect that both names are based upon the same "ultimate" types, as noted in the above. Regardless, Garilleti (1993) could not locate type material in Madrid.

*Stachys nepetifolia* is known to occur in the states of México, Hidalgo, and San Luis Potosí (Figure 6). Zuniga (1985) noted that *S. nepetifolia* is distinguished from the closely related *S. keerlii* by its larger white corollas.



25. *STACHYS NUBILORUM* Epling, Repert. Spec. Nov. Regni Veg. Beih. 80:48. 1934. TYPE: GUATEMALA. Chimaltenango: vicinity of Santa Elena, 2400-2700 m, 18 Jul 1933, *Skutch 209* (HOLOTYPE: US; Isotype: F!).

This taxon is probably closest to the Mexican *Stachys boraginoides*, having the habit and general pubescence of that species, but differs in having larger flowers and a much less prickly pubescence, if at all. Epling (1944) reported a collection from the Department of Huehuetenango (Sierra de los Cuchumatanes) with characters approaching those of *S. boraginoides* (s.l.). Standley & Williams (1973) suggested that *S. nubilorum* is "very closely allied to *S. coccinea* and perhaps only a variety of it." Turner (1994), however, excluded *S. nubilorum* from the *S. coccinea* complex, largely because of its blue or purple corollas (vs. red or orange-red).

26. *STACHYS PACIFICA* B.L. Turner, Phytologia 76:396. 1994. TYPE: MEXICO. Michoacán: Distr. Apatzingan, Aguillilla, on cliffs, 12 Oct 1930, *Hinton et al. 15319* (HOLOTYPE: LL!; Isotype: F!).

This taxon is largely confined to western México (Figure 11). It is part of the *Stachys coccinea* complex and is treated in more detail by Turner (1994).

27. *STACHYS PENANEVADA* B.L. Turner, *sp. nov.* TYPE: MEXICO. Tamaulipas: en route to Peña Nevada out of Hermosa, 18 Jul 1949, *Stanford, Lauber, & Taylor 2515* (HOLOTYPE: GH!).

*Stachydi vulnerabili* Rzed. & Rzed. similis sed foliis plerumque basalibus ovati-ellipticis vel ellipticis 3-4-plo longioribus quam latioribus (vs. plerumque late ovatis vel subcordatis, 1.0-2.5 plo longioribus quam latioribus), in amplitudine sursum abrupte deminutis, foliis midcaulinis sessilibus (vs. petiolatis), et lobis superis corollae minoribus (2.0-2.5 mm longis vs. 3-4 mm longis).

Erect or ascending herbs 15-30 cm high. Midstems pubescent with pilose delicate hairs 0.5-1.0 mm long,  $\pm$  glabrous with age. Basal leaves mostly 6-8 cm long, abruptly reduced upwards, 1.5-2.0 cm wide, their petioles 2-3 cm long. Midstem leaves linear-elliptic, sessile, 1.5-5.0 cm long, 0.4-0.9 cm wide. Flowers arranged in clusters forming terminal interrupted spikes, each cluster with 4-6 flowers on pedicels 0.5-1.0 mm long. Calyces 5-6 mm long; tubes 3.5-4.0 mm long, pubescent like the stems with either eglandular or both glandular and eglandular hairs; lobes deltoid, apiculate, ca. as long as wide. Corollas lavender with white throats; tubes 4-5 mm long, nonannulate; upper





Figure 8. Distribution of *Stachys eriantha* (closed circles).



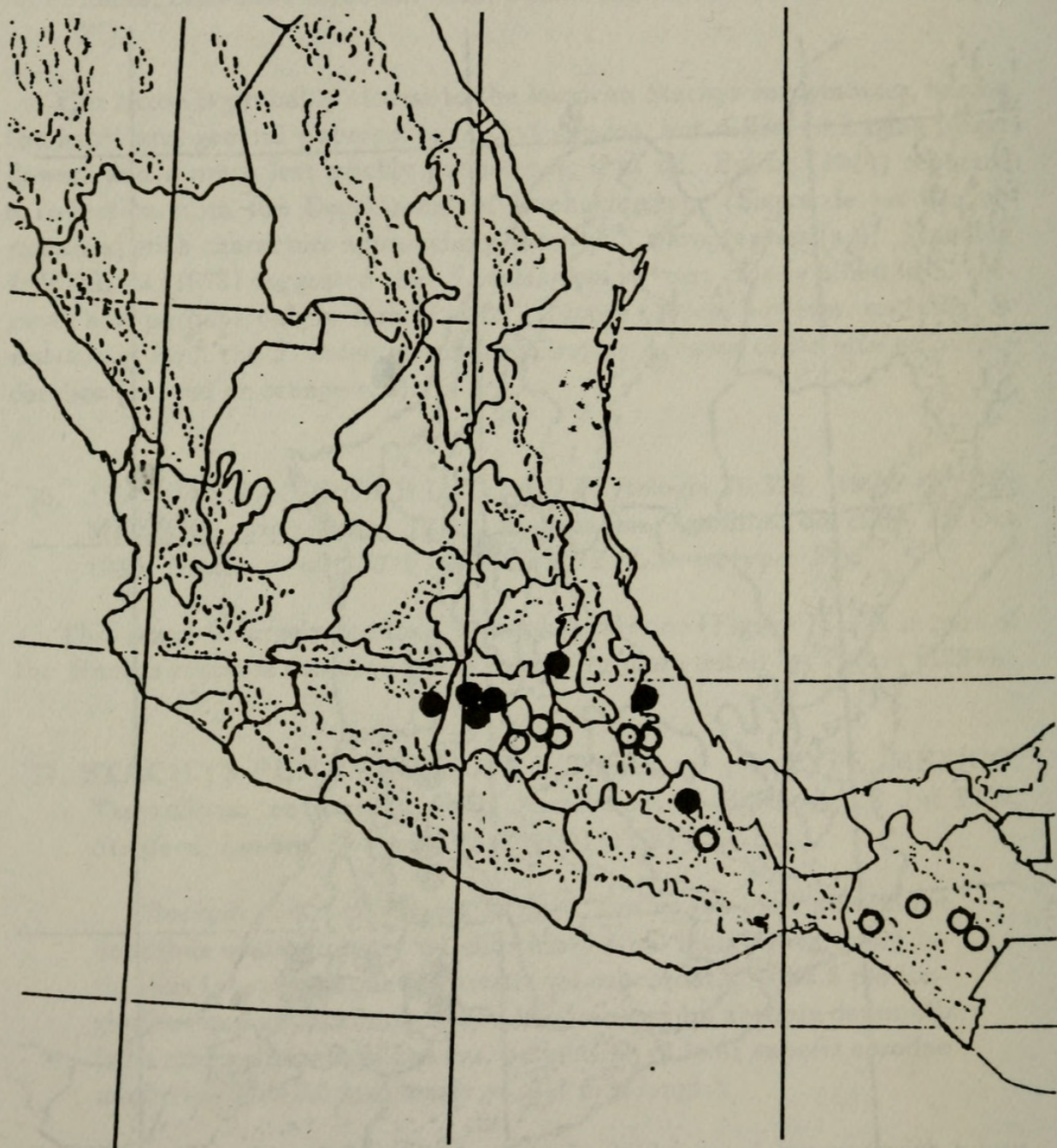


Figure 9. Distribution of *Stachys rotundifolia* (open circles) and *S. sanchezii* (closed circles).





Figure 10. Distribution of *Stachys lindenii* (closed circles), *S. albotomentosa* var. *albotomentosa* (open triangles), and *S. a.* var. *potosina* (closed triangle).





Figure 11. Distribution of *Stachys drummondii* (open triangles), *S. herrerana* (closed triangle), *S. jaimehintonii* (open circle), and *S. pacifica* (closed circles).



lips 2.0-2.5 mm long; lower lips 6-7 mm long. Nutlets ovoid, brown, somewhat compressed, ca. 1.5 mm long, 1.5 mm wide, glabrous, finely reticulate ( $\times 40$ ).

ADDITIONAL SPECIMEN EXAMINED: MEXICO. Nuevo León: area of Peña Nevada, ca. 12 km NE of San Antonio Peña Nevada, ca. 30 km E of Doctor Arroyo, N and NW slopes of mountain locally known as Picacho Onofre, ridges and valleys ca. 5 km to the NW of this peak, Jul 1977, *Wells & Nesom 339* (LL).

This taxon is closely related to *Stachys vulnerabilis* but the latter is markedly different in both habit and corolla shape, as noted in the above diagnosis. It might also be confused with *S. eriantha*, the latter also having nonannulate corolla tubes and relatively small upper lips. *Stachys penanevada* is readily distinguished from the latter by its habit, leaf shape, and corollas with longer tubes.

28. *STACHYS PILOSISSIMA* Mart. & Gal., Bull. Acad. Brux. 11, ser. 2., 194. 1844. TYPE: MEXICO. Oaxaca: savannas about Cd. San Felipe, "Yavezia et Sierria," 7000-8000 ft, May-Sep 1840, *H. Galeotti 647* (HOLOTYPE: BR!; Isotype: BR!).

*Stachys flaccida* Fernald, Proc. Amer. Acad. Arts 35:563. 1900. TYPE: MEXICO. Oaxaca: Hacienda de Caciques, "Distr. of Cuicatlan," 2150 m, 4 Aug 1895, *L.C. Smith 612* (HOLOTYPE: GH!).

*Stachys exilis* Epling, Repert. Spec. Nov. Regni Veg. Beih. 80:25. 1935. TYPE: MEXICO. Oaxaca: Cerro Verde, Jul 1908, *C. Purpus 3298* (HOLOTYPE: GH!; Isotypes: F!, MO).

?*Stachys costaricensis* Briq. ex Dur. & Pittier, Bull. Soc. Bot. Belg. 30:340. 1892. TYPE: COSTA RICA. San José: vicinity of San José, "ad S. du Barba", 2050 m, w/o date, *Tónduz 279* (HOLOTYPE: BR).

*Stachys guatemalensis* Epling, Repert. Spec. Nov. Regni Veg. Beih. 80:34. 1934. TYPE: GUATEMALA. Alta Verapaz: vicinity of Cobán, 1300 m, Nov 1902, *Turckheim 8445* (HOLOTYPE: US; Isotypes: F!, GH!).

?*Stachys vulcanica* Epling, Repert. Spec. Nov. Regni Veg. Beih. 80:33. 1934. TYPE: MEXICO. Oaxaca: Monte Zempoallepeque, 10,000-11,000 ft, 9 Jul 1894, *Nelson 696* (US).

*Stachys glechomoides* Epling, Bull. Torr. Bot. Club 71:484. 1944. TYPE: GUATEMALA. Huehuetenango: cloud forest at Cruz de Simón, Sierra de los Cuchumatanes, 2600-3000 m, 31 Jul 1942, *Steyermark 49789* (HOLOTYPE: CAS-UCLA!).



Epling (1934) placed *Stachys pilosissima* in synonymy with *S. mexicana* but later (Epling & Játiva 1966) retracted his error. The latter name applies to Californian (U.S.A.) plants, as noted by Mulligan & Munro (1989).

So as to prevent needless reexaminations of type material, I provide below a brief description of the holotype of *Stachys pilosissima*:

Perennial seemingly erect rhizomatous herb to 40 cm high. Stems moderately pubescent throughout with spreading eglandular trichomes 1-2 mm long, below these often a few short glandular hairs or a display of crinkly short hairs, but most of the surface glabrous. Midstem leaves 9-10 cm long, 3.5-4.0 cm wide; petioles 3.0-4.5 cm long, pubescent like the stems. Flowers 4-6 to a node, the pedicels ca. 1 mm long. Calyces ca. 6 mm long; tubes ca. 3.5 mm long, pilose; lobes ca. 3 mm long. Corolla tubes 7-8 mm long; upper lip ca. 3.5 mm long; annulus present. Nutlets immature or absent.

My concept of *Stachys pilosissima* is quite broad, as evident by the synonymy listed. In his account *S. costaricensis*, Epling (1934) reported collections from Mt. Orizaba (from whence the type of *S. pilosissima*) and Chiapas, but noted that "It is doubtful whether the Mexican specimens are properly associated with this [*S. costaricensis*] species". Standley & Williams (1973), while maintaining *S. guatemalensis*, sank Epling's *S. glechomoides* under the latter, noting at the same time that "this species [*S. guatemalensis*] ... may prove to be a synonym [of *S. costaricensis*]". I take the oldest legitimate name for this exceedingly variable widespread species (Figure 13) to be *S. pilosissima*, the latter distinguished from most of the related Mexican species by its large leaves with long petioles and generally pilose vestiture (the hairs mostly 0.5-1.5 mm long).

29. *STACHYS PITTIERI* Briq., Annuaire Conserv. Jard. Bot. Genève 2:119. 1898. TYPE: COSTA RICA. Massif Iscazu, valle de los Archangles, w/o date, Pittier & Durand 240 (HOLOTYPE: BR).

I have not examined material of this species, information as to type obtained from Epling (1934), who maintained the taxon. The plants concerned are apparently closely related to *Stachys pilosissima*, to judge from Epling's description, but apparently differ from the latter in being a much taller plant (ca. 1 m high) with somewhat smaller flowers, the upper lips ca. 2 mm long (vs. ca. 3.5 mm long).



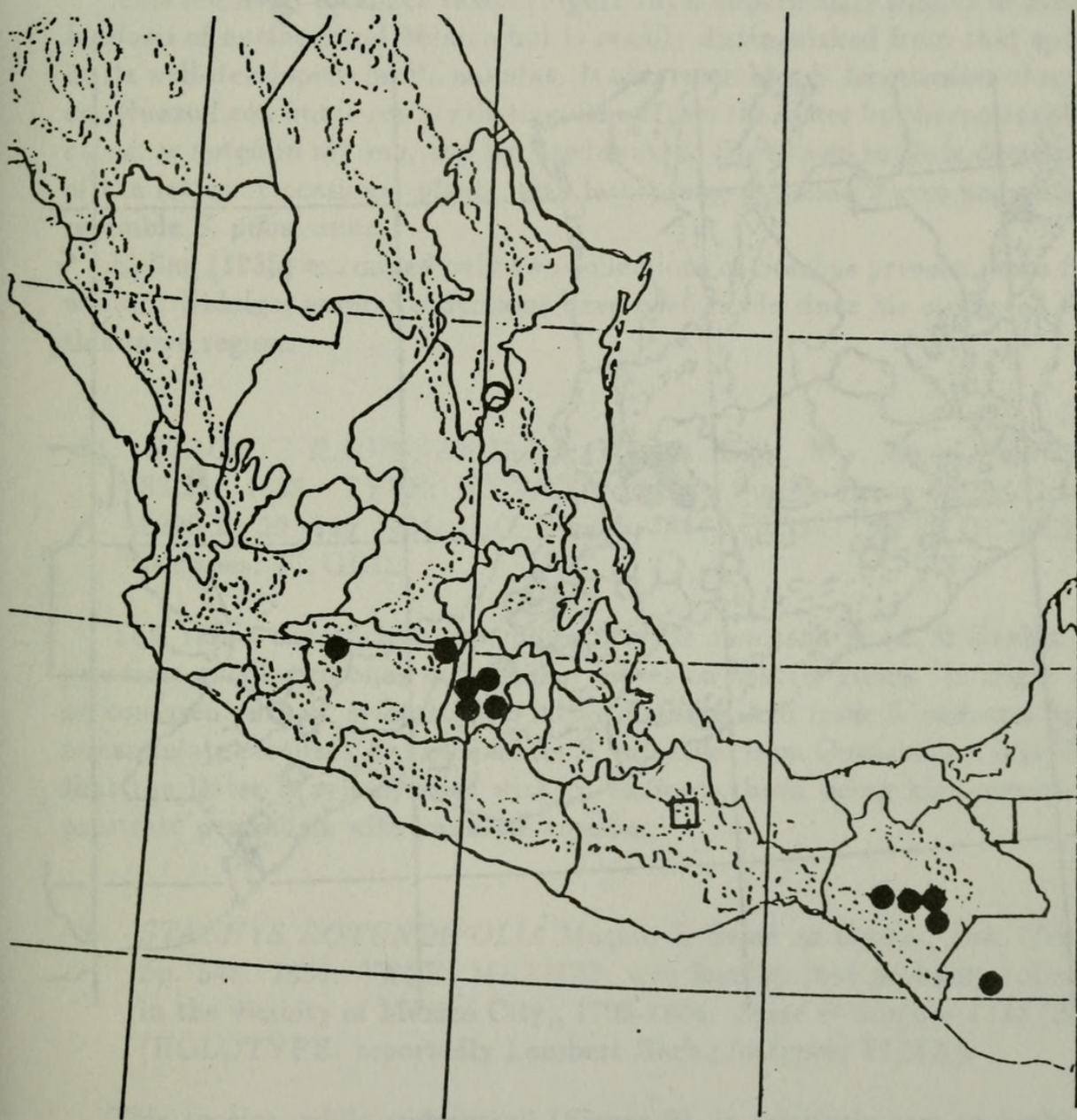


Figure 12. Distribution of *Stachys penanevada* (open circles), *S. radicans* (closed circles), and *S. torresii* (open square).



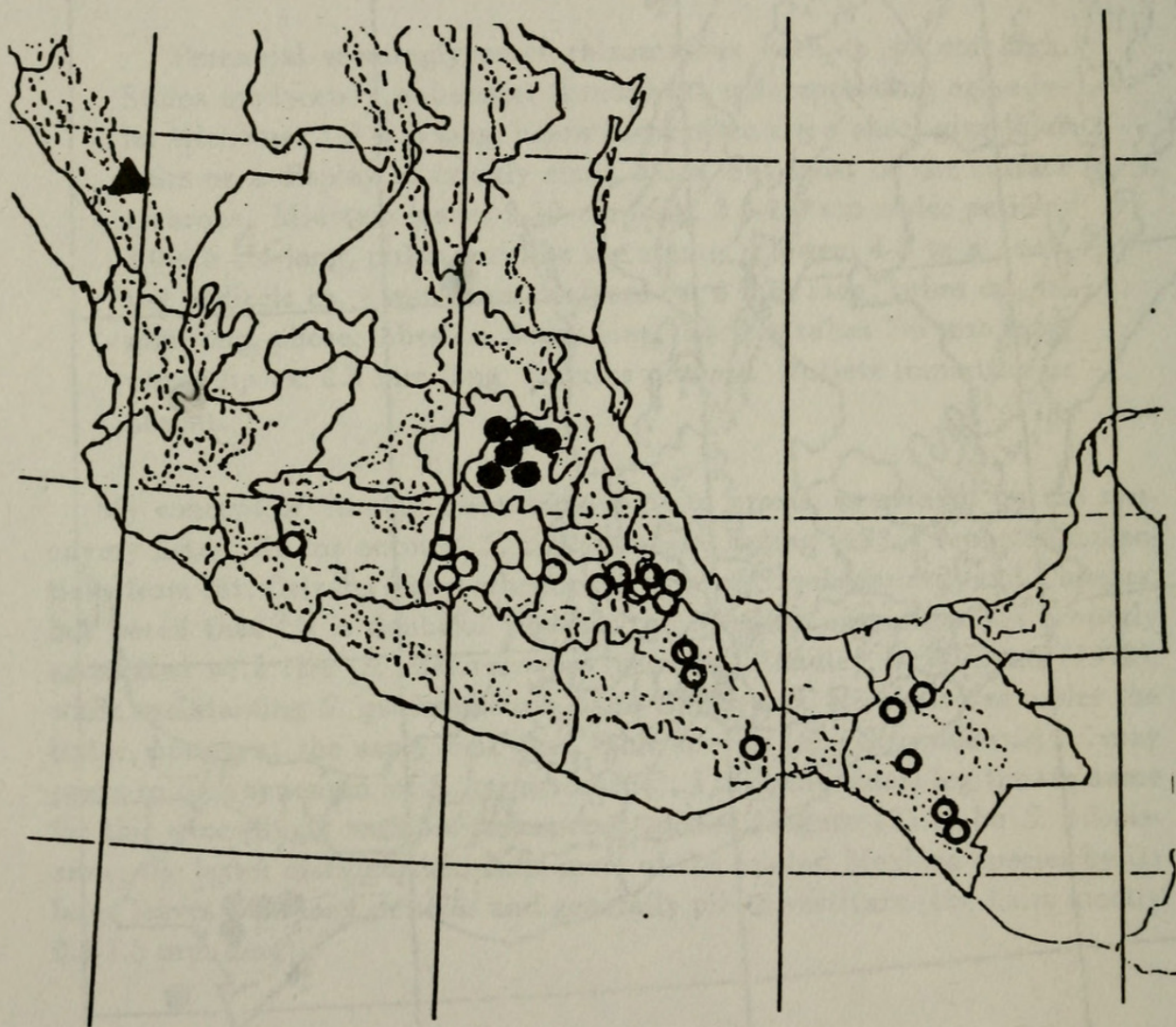


Figure 13. Distribution of *Stachys pilosissima* (open circles), *S. pringlei* (closed circles), and *S. venulosa* (closed triangle).



30. *STACHYS PRINGLEI* Greenm., Proc. Amer. Acad. Arts 41:305. 1905.  
TYPE: MEXICO. Hidalgo: near Trinidad Iron Works, 5700 ft, 11 Jul 1920, C.G. Pringle 8941 (HOLOTYPE: GH!; Isotypes: CAS!, F!).

This relatively localized taxon (Figure 13) is superficially similar to *Stachys bigelovii* of northcentral México but is readily distinguished from that species by its well-developed corolla-annulus. It also resembles *S. langmaniae* of southern Nuevo León but is readily distinguished from the latter by characters of the calyx, as noted in my key, and by Rzedowski & Rzedowski in their description of the latter. Occasional plants with large, long-petiolate leaves superficially resemble *S. pilosissima*.

Epling (1935) examined only two collections of *Stachys pringlei*, both from western Hidalgo; several collections have been made since his study, all from this same region.

31. *STACHYS RADICANS* Epling, Repert. Spec. Nov. Regni Veg. Beih. 80:26. 1935. TYPE: MEXICO. México State: Sierra de las Cruces, 9800 ft, 29 Aug 1904, C.G. Pringle 13174 (HOLOTYPE: UC-UCLA!; Isotypes: F!, GH!).

This taxon superficially resembles *Stachys sanchezii* Rzed. & Zuniga but possesses smaller corollas and smaller leaves on shorter stems. It might also be confused with *S. eriantha*, the latter distinguished from *S. radicans* by its nonannulate corollas. As noted under *S. calcicola* (from Guatemala), it is likely that the latter is synonymous with *S. radicans*, both being high-elevational prostrate perennials with annulate corollas.

32. *STACHYS ROTUNDIFOLIA* Moçino & Sessé ex Benth., Lab. Gen. et Sp. 548. 1834. TYPE: MEXICO. w/o locality [but probably collected in the vicinity of México City], 1795-1804. Sessé & Moçino 1113 [2479] (HOLOTYPE: reportedly Lambert Herb.; Isotypes: F!, MA).

This species, while widespread (Figure 9), is relatively rare in herbaria. It is rather easily identified in having only 1-2 flowers to a node, and by its broadly cordate, long-petiolate leaves. Epling & Játiva (1966) placed Epling's *Stachys guatemalensis* and *S. vulcanica* in synonymy under *S. rotundifolia* but I believe the types concerned belong to *S. pilosissima*.

33. *STACHYS SANCHEZII* Rzed. & Zuniga, Phytologia 56:321. 1984.  
TYPE: MEXICO. México State: Mpio. Zinacantepec, 3400 m, 1 Jul 1984, J. Rzedowski 38408 (HOLOTYPE: ENCB).



This high elevational (mostly 3000-3400 m) taxon is closely related to *Stachys pringlei* of western Hidalgo but is readily distinguished from it by having shorter calyx lobes and a pronounced trailing habit. *Stachys sanchezii* is largely confined to México State, but its original authors also cited a single collection from El Chico, Hidalgo (Figure 9).

34. **STACHYS SANDERSII** B.L. Turner, *sp. nov.* TYPE: MEXICO. San Luis Potosí: ca. 40 km E of San Luis Potosí along the highway to Río Verde, edge of open oak woodland along N slope of mountain, limestone outcrops, 18 Aug 1977, *R.W. Sanders 1063* (HOLOTYPE: TEX!).

*Stachydi globosae* Epling similis sed differt floribus numerosioribus per fasciculum (10-16 vs. 8-10), vestimento caulino piloso trichomatibus longioribus (1.0-1.5 mm altis vs. 0.5 mm altis), et calycibus sericei-pilosus valde contortis.

Perennial erect herbs 30-50 cm high. Midstems pilose, the vestiture 1.0-1.8 mm high, glandular hairs absent, the internodes 2-3 times as long as the leaves. Midstem leaves mostly 3-5 cm long, 1.5-2.5 cm wide; petioles 0.3-1.5 cm long; blades broadly ovate to subdeltoid, evenly appressed pilose on both surfaces, the margins crenate. Flowers arranged in (2-)3-4 globose clusters at the apices of stems, each subtended by much-reduced leaf-like bracts. Flowers per node mostly 10-16, the pedicels 1-2 mm long. Calyces 6-7 mm long; tubes 3.5-4.0 mm long, pubescent like the stems, the lobes narrowly deltoid, 3-4 mm long, 1.0-1.5 mm wide at the base, gradually tapered into subulate-awns, the latter contorting but little with age, if at all. Corollas "pinkish-purple [with a] darker reticulum in throat and lower lip" (*Sanders 74034* [TEX]); tubes 6-7 mm long, annulate within ca. 1.5 mm from the base; upper lips 2.0-2.5 mm long; lower lips 3-4 mm long. Anthers 4, purplish, exserted for 0.5-1.0 mm, the outer pair ca. 0.5 mm longer than the inner and reflexed at maturity. Nutlets ovoid ca. 1.5 mm long, 1.1 mm wide, brown, glabrous, the surfaces finely reticulate ( $\times 40$ ).

ADDITIONAL COLLECTIONS EXAMINED: MEXICO. San Luis Potosí: same area as the type but 4 km along side road to microwave tower, near crest, 2700 m, 29 May 1974, *Sanders 74034* (TEX); Alvarez, 19-31 Dec 1934, *Orcutt 1972* (CAS); region of San Luis Potosí, 1878, *Parry & Palmer 735* (GH); in sandy soils near San Luis Potosí, 1876, *Schaffner 684* (GH).

This taxon is closely related to *Stachys globosa* but differs from the latter in having more numerous florets to a node, much longer pilose vestiture and calyces with lobes which do not display much contortion at maturity. Because of its numerous flowers per cluster and pilose vestiture, which enhances the globosity of each cluster of flowers, the taxon might be more deserving of



the epithet "globosa" than *S. globosa* itself, the latter typified by plants from easternmost San Luis Potosí. Epling included specimens of *S. sandersii* in his concept of *S. globosa* (e.g., *Parry & Palmer 735, Schaffner 684*, cited above).

I have opted to name this fine looking species for Dr. Roger Sanders, an academic son of mine who rendered an excellent monograph of the difficult section *Brittoniastrum* of *Agastache* (Lamiaceae).

35. *STACHYS TENERRIMA* Epling, Repert. Spec. Nov. Regni Veg. Beih. 79:32. 1935. TYPE: MEXICO. Baja California Sur: San José del Cabo, vicinity of San Bartolome, 23 Oct 1890, *T.S. Brandege* s.n. (HOLOTYPE: UC-UCLA!).

The larger corollas readily distinguishes this Cape species from *Stachys ajugoides*, the latter extending into northern Baja California from the U.S.A.

Epling (1935) described this well-marked taxon as annual, but it looks to be perennial, or it persists so as to appear perennial. It seems largely confined to the Cape Region (Figure 4) being readily distinguished from most Mexican species by its long-pedicelled flowers with weakly annulate corollas and nearly glabrous calyces.

36. *STACHYS TORRESII* B.L. Turner, Phytologia 76:397. 1994. TYPE: MEXICO. Oaxaca: Distr. Mixe, "En los primeros 5 km de el camino a Villa Alta, entrado por la desviación que esta aprox. a 10 km de Totontepec ... Veg. Ruderal de bosque mesófilo con neblina"., 13 Dec 1985, *R. Torres C. 7925* (HOLOTYPE: F!; Isotype: MEXU).

This taxon is known only by type material. It belongs to the *Stachys coccinea* complex, which is treated in more detail by Turner (1994).

37. *STACHYS VENULOSA* E. Greene, Pittonia 1:157. 1888. TYPE: MEXICO. Durango: Sierra Madre, W of Durango, 8100 ft, Sep-Oct 1881, *A. Forrer* s.n. (LECTOTYPE [designated here]: UC-UCLA!; Isolectotypes: GH!).

Known to me only by type material.

38. *STACHYS VULNERABILIS* Rzed. & Rzed., Acta Bot. Mex. 3:3. 1988. TYPE: MEXICO. Nuevo León: Mpio. Galeana, Cerro El Potosí, cerca de la cima, 3460 m, 7 Jul 1987, *S. González 4029* (HOLOTYPE: ENCB).



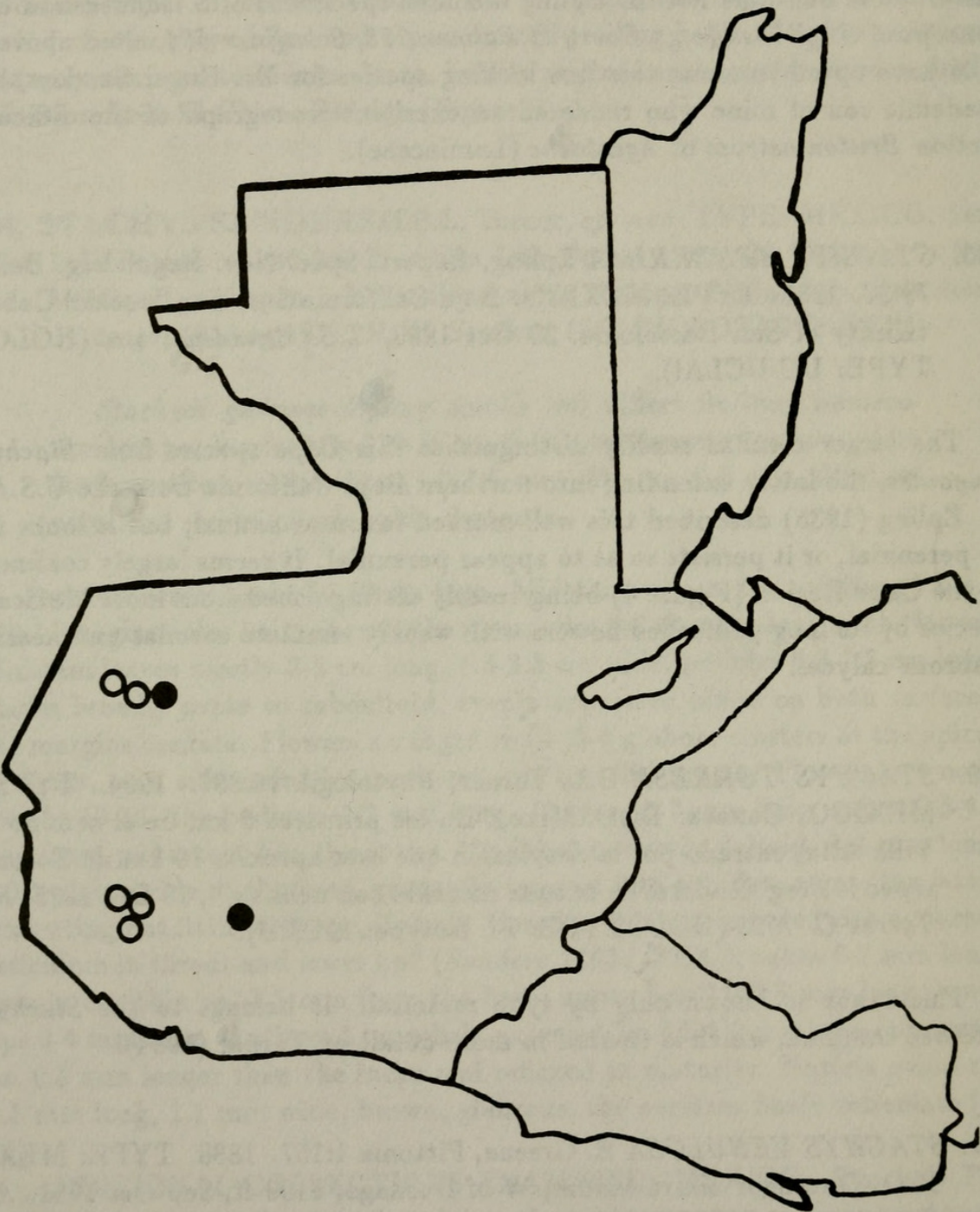


Figure 14. Distribution of *Stachys calcicola* (open circles) and *S. nubilorum* (closed circles).



This taxon is confined to the subalpine and alpine regions (3000-3600 m) of Cerro Potosí, Nuevo León (Figure 5). It is known by 20 or more collections (LL, TEX), and was apparently first collected by Beaman (TEX) in 1961, the latter identified as *Stachys eriantha* by Epling. The original authors thought *S. vulnerabilis* to relate closely to *S. langmaniae*, which it surely does, but the latter can be distinguished by having a more strongly developed corolla-annulus, less coarsely developed calyx hairs, and longer-exserted anthers (2-3 mm vs. 0.5-1.5 mm).

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